they go abroad and see more with every year. Above all things, therefore, let there be no stint of home letters. Pens, ink, paper, and postage are even cheaper than they used to be in our grandfathers' time, so there is no practical reason for our domestic, well-bred accomplishment of letter-writing to fade just yet into one of the occult sciences.

Rowland Hill, fifty years ago, became the benefactor of mankind by introducing the system of penny postage stamps. He had, doubtless, before his eyes visions of delight—the homes of the poorest daily brightened by the winged messengers of Mercury. Alas! the good man could not foresee that "familiarity" might really "breed contempt"; and that it requires more than cream laid paper, square envelopes, and a penny postage stamp to produce a letter worthy of the name!

Flood-Tide.

By Dr. J. E. Taylor, F.L.S., F.G.S., &c., *Editor of "Science Gossip."*

The tide of summer life is now "taken at the flood." It has reached the high water mark of the year. July is the heyday of organic existence in the northern hemisphere. The commandment to "increase and multiply, and replenish the earth" is being obeyed alike in the animal and the vegetable worlds. July is the most earnest, the most important month of the whole year to by far the greater number of living things. At no other time is the battle of life so keenly fought out—at no other period is the law of natural selection, and, as a result, the survival of the fittest, so rigidly carried out. Both these processes simply mean weeding the garden. If the strongest and best of living animals and plants—those best suited to their environments—are to be the ancestors of generations yet to come, these laws must have free course ere they can be justified. The thoughtful naturalist sees in their draconic operations the constant working of a Divine Providence, not of a capricious deity. It is because of them that the stream of life on our globe has swollen, like a great river, from a small stream to the mighty flood which now fills earth and sea.

The green lanes are thronged with young birds. They swarm everywhere, and flit along before you as you proceed from bank to bank and bush to bush. Nature's avian orchestra is for the time subdued. The old birds are too busy obtaining food for their greedy young to have much time for singing. You have to get up in the very early morning to catch their songs. Then for a brief period, during which the callow young get their singing lessons, you may listen to their many voices and their multitudinous notes as if it were the month of May. In the day time, the voices of the birds are usually alarm cries or recognition notes. The voice of the nightingale is no longer heard in the land, for it rarely sings after the first week in July. In the marshes by the river, probably, you will still hear the sweet night song of the sedge warbler, and might mistake it for that of the nightingale. Many people do. With the end of July the close season for wild birds terminates.

But, if one cannot say much that is fresh concerning the birds, the same does not apply to insects. Indeed, the latter are now in the flood-tide of their brief lives. I hardly know where to begin or to end. The butterflies by day and the moths by night are more than sufficient to occupy the naturalist's whole time and observation. I use the latter word advisedly, and would refer all my readers to Mr. E. B. Poulton's recently published and highly suggestive book on "The Colours of Animals." There they will discover the real meaning of the vast varieties of colouration, dot, streak, tint, and tone in caterpillars, chrysalids, butterflies, and moths. To many people unread in the most wonderful book in the world, that of Nature, the subjects discussed will come as a new revelation—to those who have been privileged to serve at the altar, to live in God's workshop, all new information tends only to deepen the reverence which already consumes their souls! Doubtless all my readers have read that wonderfully sympathetic poem of Longfellow addressed to Agassiz on his fiftieth birthday. If not, read it at once, and note the spirit in which the true naturalist observes and works.

Consequently, the old-fashioned "Natural History" of the Gilbert White school is coming in again. Intelligent and careful observations are more required than ever. The new philosophy of biology has given a fresh meaning to old observations, and has suggested a crowd of new ones.

In this spirit, go into the lanes and woods. Into the country lanes particularly, for there you find growing plants and shrubs which cultivation has largely expelled from the fields and pastures. The colour-tints and streaks of every insect have each and all a meaning and purpose—a meaning and a purpose which may have reference to different physical and climatal conditions to the present, experienced by the ancestors of the butterflies which are chasing each other in sportive glee along these flower-haunted lanes. One can hardly help being struck by the broad fact that whereas day-flying insects are usually vividly or brilliantly coloured, night-flying kinds are very inferiorly so, nay, even discoloured. The eyes of butterflies are now known to differ from the eyes of moths. The former are crowded with those optical colour-sense organs termed *rods*—the latter with cones instead, or non-perceptive colour-sense organs. A butterfly sees a *coloured* picture of a flower—a moth an *engraving* of the same. Practically, all night-flying insects have become colour-blind.

How this has reacted on flowers, and our love of them—to say nothing of the development of the æsthetic faculty generally. The world would never have been clad with its floral robes if insects had never appeared. And then what could we have made of that touching lesson of the Saviour which directs the attention of weak-kneed believers to the "Lilies of the Field," clad in colours which exceeded the traditional raiment of Solomon in all his glory. Do most of us, even now, understand sufficient of the laws of colouration of flowers, and their relationships to the insects which frequent them, to sufficiently understand that reference to the "lilies of the field"?

I do not care to give merely an inventory of butterflies, moths, and beetles, now to be observed. They are marrying and giving in marriage. They are laying their eggs on the proper food-plants—plants they never eat (for the adult insects cannot)—and whose flowers they seldom visit. Nevertheless, almost with unerring certainty, they lay their eggs exactly on those plants which the newly-emerging caterpillars will commence to devour, having found a spread-table for them, thanks to that accumulated experience of their ancestors which we denominate *instinct*. Every one of our native wild flowers is haunted by the larvæ of both butterflies and moths, and has to pay them black-mail in the shape of extra leaves to be devoured; for, it may be, the flowers of these same plants will be dependant upon the fully-developed winged insects for cross-fertilisation. Let all of my readers who are interested in finding out what the larva of various kinds are, now to be found feeding on the common plants of our green lanes, procure the Rev. J. Seymour St. John's cheap and little pocket-book, entitled "Larva Collecting" (London: W. Wesley & Son). They will there find, after the name of every plant, a list of the caterpillars which prey upon it, and on what part of the plant.

Now issue forth the ringlet butterfly, common in woods; the rare dark green fritillary (commonest on the green hill-sides, where its colour is protective); the silver-streak butterfly; the pretty black hair-streaks and purple hair-streaks, both good finds; the clouded yellow (to be looked for in clover fields); the small skipper butterfly; the high-brown fritillary (in woods); the gate-keeper, along the hedge-rows; the marbled white (a delightful butterfly), in the fields; the small tortoiseshells and more striking peacocks (everywhere in flower gardens); the splendid and large white admiral (in woods where honeysuckles are abundant); on the grassy chalk downs, the chalk hill blue (flitting about like the minute fragment of a Mediterranean sky); the glorious red admiral suns itself on sunny places in our gardens and along the lanes; on the heaths, the grayling is abundant; and the painted lady butterfly is common along road-sides where thistles grow, fluttering like a blown leaf, and quite inconspicuous when it settles to the ground.

Of the moths (or night-flying insects) which abound in July, I can only notice the commonest. Let me perpetrate a bull, and begin with the night-flying insects which fly by day! Practically, these are moths which have forsaken the habits of their kind, and whose optical modifications as regards colour-sense enable them to compete with butterflies. There is the large fine-spot Burnet moth among the meadows where clover grows; the *Sesias* (or clear-wings), so mimicking the appearances of bees, wasps, and hornets that they are protected thereby, and are also abundant on dry, hot days.

By "sugaring" the trees of the garden, or along an avenue, or in the lanes, just at night-fall, you may get an abundance of moths, taken by dark-lantern light. It is better, however, to look for them by day, when they are hiding up, for you then learn how marvellous are their methods of concealment, and how wonderfully every mark, line, and tint resembles the external natural surroundings. Indeed, I much prefer, on this account, hunting for moths in the daytime. One learns so much more about their differential colours, or lack of them, then.

On banks, clasped against branches, or flattened against tree trunks and palings, or clinging to green leaves, twigs, and stems, or lying on the withered grass, or hidden in the crannies

of the bark, may be found a multitude of moths hiding up from their keen daylight enemies. The popular English names of moths are frequently not bad means of identifying their colour or general appearance. Thus—in July there is an abundance of the light-emerald moth; beautiful carpet (what an expressive name!); common carpet; clouded brindle; orange moth; dusky brindle; drinker moth; mottled beauty; broad-bordered yellow underwing (in meadows); the muslin moth (on stone walls); the clouded yellow (on bushes); the white satin; footman; currant hawk (about the currant bushes in gardens); the old lady (poor, dusky thing!); buff arches; the currant swallow-tailed moth; the too-abundant but very pretty magpie moth of our gooseberry gardens; the yellow tail; wainscot; gate-keeper (in the hedges); light arches (on grasses); tiger moth; orange swifts (on heaths); lackey; lesser yellow underwing; willow beauty; gothic moth (on walls); oak eggar (about the hedgerows); dun footman; red twin-spot carpet; dun-bar; July high-flyer; copper underwing; goat moth (about trees and palings), where the presence of the wood-boring larvæ can be detected by the sawdust they have created; and many others which, as auctioneers say, are "too numerous to mention!"

But what shall I say, and what space remains for me to say it in, of the flowers of July? It is also "flood tide" with them. More plants blossom in July than in any other month in the year.

First, let me draw the attention of my readers to the diseases of flowering plants. Every species is liable to special attacks—all are open to epidemics. In July you find "rust," "bunt," "smut," and "mildew" attacking the cereal crops like so many epidemics. They are vegetable epidemics as the epidemical diseases we call smallpox, measles, typhoid, cholera, &c., are. Possibly *all* epidemic diseases are caused by low or degraded vegetable organisms. They attack animals and plants alike—they operate in the crowded cornfield as they do in the over-crowded city.

Just now you can hardly pause and linger over any common plant without finding some fungoid parasite preying upon it. You will find all about them (with coloured plates and descriptions) in Dr. M. C. Cooke's "Microscopic Fungi," a cheap and altogether good book (London, Messrs. Allen & Co). I and my children sometimes go out for a morning's walk solely to see how our vegetable patients are getting on, and to collect samples of their complaints.

It goes without saying that I must leave what I would have liked to say most about, to say the least about. *Space* is as necessary for a magazine to move in as for a planet.

"Multitudes, multitudes, in the Valley of Decision." How my heart goes forth towards these wayside flowers! There is not one of them which has not a halo of folk-lore about it. It has been associated with once living beliefs of witches, and devils, and saints. The common names these plants bear are *fossil* to us in these enlightened days. What historical sermons are uttered to us by these floral phonographs! Not only can he who runs read, but he can have these histories read out to him, if he lists. There is the skull-cap, musk-mallow, common hawkweed, various species of St. John's worts, various species of thistles (wonderful colonies of flowers), willow herbs by watersides; polygonums, decorating otherwise waste places, as wreaths do newly-made graves; rest harrows, on dry hedge-banks and commons; hare-bells, on heaths (perhaps one of the most exalted and highly developed of floral types); blackberries, blossoming as if that were the chief end of life (as to them it is, except fruiting); the fragrant mints, throwing out more perfume the more you trample on them (like so many vegetable saints); the pink centuary, on dry banks and hillsides; elecampane, in moist pastures; yellow sow thistles, in the cornfields (keeping company with blue and purple "corn-cockles," "cockle" means a weed, a "plant in the wrong place"); yellow and white water-lilies, in the rivers, and streams, and ponds; the travellers' joy, at its best is festooning the hedge-rows; *scabiosas* or "devil's bits," on heathy pastures (worthy their Northern name of "blue buttons); all the heathers coming into flower on the heaths. Verily, this is a month to be glad in. At no other time of year has a man or woman or child such a glorious chance of coming within touch of living things, or of being acquainted with the laws of their lives. We bring away from their study much of what we take with us to it. Hence the necessity of approaching this "living garment of a living God," in at least quite as reverent a spirit as the ancient Israelites approached the "Holy of Holies" within the sheep-skin-constructed Tabernacle in the wilderness.

Another Reading Lesson.

By A. C. Beale.

There are two ways of regarding the teaching of reading. One is to look on it merely as furnishing the pupil with a necessary instrument of further education; the other to use it also as an educational instrument in itself. A previous paper seemed to me to treat the subject almost, if not wholly, from the first point of view, I would ask leave now to set forth the second.

I am far from wishing to detract from the importance of the first view (although I believe most people greatly exaggerate the use of reading to very young children), yet, as a disciple of Fröbel, I consider that every subject should be taught in such a way as to develop intelligence and faculty, not, as is too often the case, especially with reading, to stupefy. Let me, however, assure my readers that experience has proved that, by this method, not only is the object aimed at, viz., the development of intelligence, attained, but that pupils are also more interested, pronounce more distinctly, and learn also much more rapidly. I should also add that pupils who have been considered hopeless cases have not only learnt to read themselves, but have become enthusiastic teachers of younger members of the family. When I say too pupils could read, that means that they could not only read words they had seen and learnt, but that, with a few exceptions, they could make out new ones with ease and pleasure. I have thus been led to believe that if natural, and therefore reasonable, methods were adopted in homes and in all schools, the irksomeness of learning to the pupils would be greatly lessened.

I was led to consider carefully the subject of the teaching of reading, because, for various reasons, it appeared to be necessary